REMARKS

Claims 10-11, 15, 25-26, 30-58, 62, and 66-82 remain pending in the application. Favorable reconsideration is respectfully requested in view of the above amendments and the following remarks.

The allowance of claims 10-11, 25-26, 31-40, 41-58, 62, and 66-72 is again gratefully acknowledged.

Claims 15, 30, and 73-82 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Easton (USP 5,764,687) (henceforth "Easton") in view of Rouphael et al. (USP 6,278,725) (henceforth, "Rouphael"), and further in view of Clark (USP 6,459,888) (henceforth, "Clark"). This rejection is respectfully traversed.

As explained in Applicants' specification beginning at page 18, line 17, the problem of how to handle a frequency error between a local frequency reference of a receiver such as a mobile station and the carrier frequency of a transmitter is aggravated if the receiver receives signals from multiple transmitters at the same time, e.g., if a mobile station is communicating with more than one base station simultaneously, as in a soft handover situation. This problem is addressed by handling (e.g., combining) received path rays from different base stations separately. This is useful because, by individually applying the AFC algorithms to each base station, the frequency offset between the mobile station and the base stations can be determined, thereby allowing a decision to be made as to what the final frequency offset should be. See, e.g., Applicants' specification at page 19, lines 9-22.

Independent claims 15, 30, 73, and 75 define embodiments that include this solution to the problem. In particular, claim 15 defines a transceiver that includes, *inter alia*, "frequency error estimators for computing a frequency error estimate for each ray based on successive values of a respective one of the channel estimates; and at least two summers for performing weighted summations of groups of the frequency error estimates to provide at least two combined frequency error estimates, wherein: each of the combined frequency error estimates corresponds to a respectively different one of at least two base station transmitters" (emphasis added).

Independent claim 30 similarly defines a method that includes, *inter alia*, "performing at least two weighted summations of groups of the frequency error estimates to provide at least two combined frequency error estimates, wherein each of the combined frequency error estimates corresponds to a respectively different one of at least two base station transmitters" (emphasis added).

Similarly, independent claim 73 defines an apparatus that comprises, "frequency error estimators for estimating frequency errors separately for different signal paths; and combiners for combining groups of the frequency error estimates to produce at least two combined frequency error estimates, wherein each of the combined frequency error estimates corresponds to a respectively different one of the two or more transmitters" (emphasis added).

Independent claim 75 similarly defines a method that comprises "estimating frequency errors separately for different signal paths; and combining groups of the frequency error estimates to produce at least two combined frequency error estimates, wherein each of the combined frequency error estimates corresponds to a respectively different one of the two or more transmitters" (emphasis added).

The Office acknowledges that Easton fails to disclose producing at least two combined frequency error estimates and at least two summers for performing weighted summations of groups of the frequency error estimates to provide at least two combined frequency error estimates, wherein each of the combined frequency error estimates corresponds to a respectively different one of at least two base station transmitters. The Office now relies on Rouphael as making up for some, but not all, of these deficiencies.

This reliance is unfounded for at least the following reasons. Rouphael's arrangement provides a number of frequency discriminators 110-1, 110-2,..., 110-3, each associated with a respectively different one of the Rake fingers 210, 212, 214. Each of the frequency discriminators 110-1, 110-2, ..., 110-3 generates an output $\Delta\omega_i$ ($i = 1$ to N) that is used in two different ways. First, each of the frequency discriminator outputs $\Delta\omega_i$ ($i = 1$ to N) is supplied to circuitry (adder 207, loop filter 175, and a divide by N circuit 230) that generates an average frequency error value *computed across all of the Rake fingers without regard to what transmitter those frequency error values are associated with.*

Second, each of the frequency discriminator outputs $\Delta\omega_i$ ($i = 1$ to N) is supplied to a respective one of the adders 250, 255, 260. Each of the adders 250, 255, 260 also receives the computed average frequency error value from the circuitry discussed above. Using these inputs, each of the adders 250, 255, 260 generates the rough estimate of the actual shifted frequencies present in a respective one of the Rake fingers. Thus, the frequencies provided from adders 250, 255, 260 are the corrected frequencies as shifted by the Doppler shift. (See, e.g., Rouphael at column 6, lines 16-25.)

The Office argues that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the CDMA transceiver apparatus and method of Easton with the teaching of Rouphael's Rake receiver such that it will employ at least two adders to add the average frequency estimate with the frequency error outputs of the frequency discriminators. The Office states that the motivation for doing so is to remove the Doppler frequency offset from each Rake finger and thereby remove the causes for performance degradations induced by various frequency offsets in the system.

The Office's reasoning is flawed in several respects. First, it is not understood why one would want to provide two adders in Easton for adding the average frequency error (i.e., one combined estimate) to the outputs of frequency discriminators because the Easton arrangement is not designed to produce a Doppler shift per finger. Why subtract the computed average from the very quantities that are being combined to compute the average? The Office is reminded that "If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). (See MPEP §2143.02 VI, p. 2100-130 (Rev. 5, Aug. 2006). Thus, Applicants challenge the assertion that there would have been any motivation to make the Office's proposed combination.

Nonetheless, even if the combination of Easton and Rouphael were made, as proposed by the Office, the outputs from the adders would represent adjusted discriminator outputs, one per finger. The Office appears to argue that these are the combined frequency error estimates as recited in Applicants' claims. However, they are not because the proposed modification would merely result in adjustment of the discriminator outputs by an average value. The discriminator outputs would not be combined from a subset of paths, as would be required to generate combined frequency error estimates. Accordingly, the combination of Easton and Rouphael would lack the features required to support the Office's rejection.

As to other aspects of the rejection, the Office correctly acknowledges that neither Easton nor Rouphael discloses combined frequency error estimates corresponding to a respectively different one of at least two base station transmitters, but relies on Clark as making up for this deficiency.

Specifically, the Office argues that Clark discloses each Doppler shift corresponding to a frequency error that is associated with a different base station, and concludes that it would have been obvious to one of ordinary skill in the art at the time that invention was

made to modify the combined system of Easton and Rouphael with the teaching of Clark in having a different Doppler shift-related frequency offset correspond to a different base station such that the combined system of Easton and Rouphael would comprise each of the combined frequency error estimates corresponding to a respectively different one of at least two base station transmitters. This argument is flawed at least because Doppler shifts can be due not only to the transmitter location (i.e., which base station is transmitting) but also to path orientation (i.e., which path the signal took from that base station to the receiver). For this reason, the Doppler shift estimates cannot be said to correspond to frequency offsets associated with a particular base station.

A key point in this regard is that *different paths from the same base station will have different Doppler shifts*. For this reason, Applicants' claimed embodiments combine frequency errors from different paths of the same base station to average out the Doppler shift due to path orientation so that the offset due to the transmitter remains. The prior art of record fails to disclose or suggest this, and therefore cannot support a *prima facie* case of obviousness against Applicants' claimed embodiments.

In view of the foregoing, it is respectfully asserted that each of the independent claims 15, 30, 73, and 75, as well as their related dependent claims 74 and 76-82 are patentably distinguishable over the prior art of record. Accordingly, it is respectfully requested that the rejection of claims 15, 30, and 73-82 under 35 U.S.C. §103(a) be withdrawn.

The application is believed to be in condition for allowance. Prompt notice of same is respectfully requested.

Respectfully submitted,

Potomac Patent Group PLLC

Date: April 18, 2007

By: /Kenneth B. Leffler, Reg. No. 36,075/
Kenneth B. Leffler
Registration No. 36,075

P.O. Box 270
Fredericksburg, Virginia 22404
703-718-8884